What is claimed is:

1. A variable stiffness guide wire, comprising:

a guide wire shaft having a proximal portion and a distal portion, the distal potion having a flexibility;

a polymeric member disposed on the distal portion of the shaft, the polymeric member having a first flexibility at a first temperature and a second flexibility at a second temperature, wherein the first temperature is less than the second temperature and the first flexibility is less than the second flexibility; and

a heat source disposed on the distal portion of the shaft, the heat source being in thermal communication with the polymeric member, whereby activation of the heat source causes the polymeric member to rise from the first temperature to the second temperature to thereby change the flexibility of the distal portion of the guide wire.

2. A variable stiffness guide wire as in claim 1, wherein the polymeric member comprises a shape memory polymer.

3. A variable stiffness guide wire as in claim 2, wherein the shape memory polymer has a glass transition temperature, and wherein the first temperature is below the glass transition temperature.

4. A variable stiffness guide wire as in claim 3, wherein the second temperature is above the glass transition temperature.

5. A variable stiffness guide wire as in claim 1, wherein the heat source comprises a resistive heating element.

6. A variable stiffness guide wire as in claim 5, wherein the distal portion of the shaft includes a tip portion.

7. A variable stiffness guide wire as in claim 6, wherein the tip portion includes the polymeric member and resistive heating element.

8. A variable stiffness guide wire as in claim 7, wherein the polymeric member comprises a tube.

9. A variable stiffness guide wire as in claim 8, wherein the resistive heating element comprises a coiled wire.

10. A variable stiffness guide wire as in claim 9, further comprising one or more lead wires connected to and extending proximally from the coiled wire.

11. A variable stiffness guide wire as in claim 10, wherein the polymeric tube is disposed on the coiled wire.

12. A variable stiffness guide wire as in claim 11, wherein a core wire extends through the tip portion.

13. A variable stiffness guide wire as in claim 12, wherein the proximal portion of the guide wire shaft includes a hypotube.

14. A variable stiffness guide wire as in claim 13, wherein the distal portion of the guide wire shaft includes a slotted hypotube.

15. A variable stiffness guide wire as in claim 14, wherein the coiled wire is disposed in the slots of the slotted hypotube.

16. A variable stiffness guide wire, comprising:

a guide wire shaft including a proximal portion and a distal portion having a flexibility;

a polymeric member disposed on the distal portion of the shaft; and

a heat source in thermal communication with the polymeric member, whereby activation of the heat source causes the polymeric member to change the flexibility of the distal portion of the guide wire shaft.

17. A variable stiffness guide wire as in claim 16, wherein the polymeric member comprises a shape memory polymer.

18. A variable stiffness guide wire as in claim 17, wherein activation of the heat source causes the shape memory polymer to change temperature.

19. A variable stiffness guide wire as in claim 18, wherein the shape memory polymer has a glass transition temperature, and wherein the change in temperature is across the glass transition temperature.

20. A variable stiffness guide wire as in claim 18, wherein the shape memory polymer has a glass transition temperature, and wherein the change in temperature is near the melt temperature.

21. A variable stiffness guide wire as in claim 16, wherein the heat source comprises a resistive heating element.

22. A variable stiffness guide wire as in claim 21, wherein the distal portion of the shaft includes a tip portion.

23. A variable stiffness guide wire as in claim 22, wherein the tip portion includes the polymeric member and resistive heating element.

24. A variable stiffness guide wire as in claim 23, wherein the polymeric member comprises a tube.

25. A variable stiffness guide wire as in claim 24, wherein the resistive heating element comprises a coiled wire.

26. A variable stiffness guide wire as in claim 25, further comprising one or more lead wires connected to and extending proximally from the coiled wire.

27. A variable stiffness guide wire as in claim 26, wherein the polymeric tube is disposed on the coiled wire.

28. A variable stiffness guide wire as in claim 27, wherein a core wire extends through the tip portion.

29 A variable stiffness guide wire as in claim 28, wherein the proximal portion of the guide wire shaft includes a hypotube.

30. A variable stiffness guide wire as in claim 29, wherein the distal portion of the guide wire shaft includes a slotted hypotube.

31. A variable stiffness guide wire as in claim 30, wherein the coiled wire is disposed in the slots of the slotted hypotube.

32. A variable stiffness guide wire system, comprising:

a guide wire including a distal portion having a flexibility, a distal polymeric member, and a heat source in thermal communication with the polymeric member; and

a power supply connected to the heat source, whereby activation of the heat source by the power supply causes the polymeric member to change the flexibility of the distal portion of the guide wire.

33. A method of using a variable stiffness guide wire, comprising the steps of:

providing a guide wire including a distal portion having a flexibility, a distal polymeric member, and a heat source in thermal communication with the polymeric member; and

changing the flexibility of the distal portion of the guide wire by activating or deactivating the heat source.

34. A method of using a variable stiffness guide wire as in claim 33, wherein the flexibility changing step comprises activating the heat source to increase the flexibility of the distal portion of the guide wire, the method further comprising the step of navigating the guide wire through a patient's vasculature to a target site.

35. A method of using a variable stiffness guide wire as in claim 34, further comprising the step of deactivating the heat source to decrease the flexibility of the distal portion of the guide wire.

36. A method of using a variable stiffness guide wire as in claim 35, further comprising the step of advancing a device over the guide wire to the target site.

37. A method of using a variable stiffness guide wire as in claim 33, wherein the polymeric member comprises a shape memory polymer having a glass transition temperature, and wherein the flexibility changing step comprises heating the polymeric member near the melt temperature.

38. A method of using a variable stiffness guide wire as in claim 33, wherein the polymeric member comprises a shape memory polymer having a glass transition temperature, and wherein the flexibility changing step comprises heating the polymeric member above the glass transition temperature.

39. A method of using a variable stiffness guide wire as in claim 33, wherein the heat source comprises a resistive heating element, and wherein the activating step comprises supplying electrical energy to the resistive heating element.